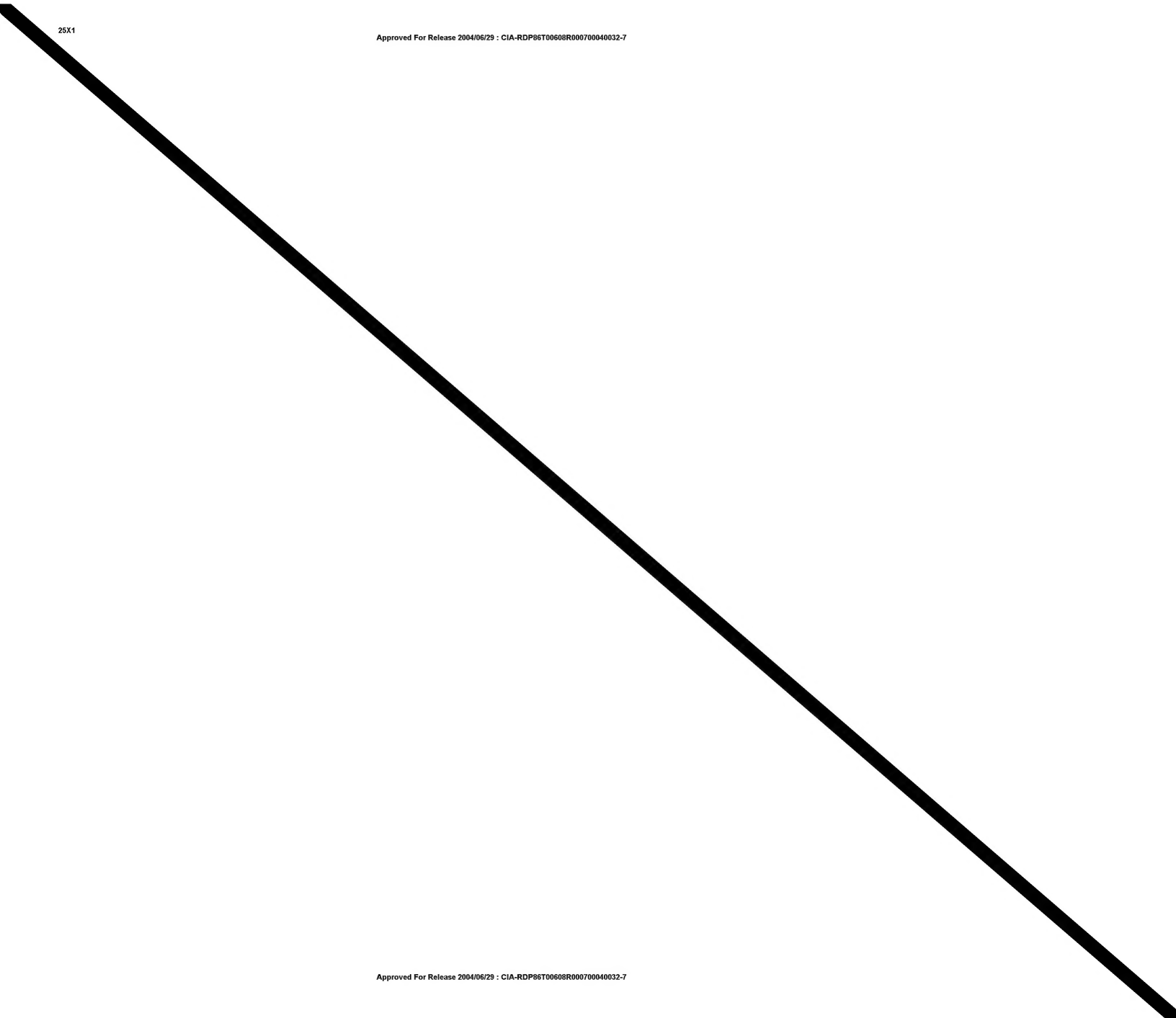

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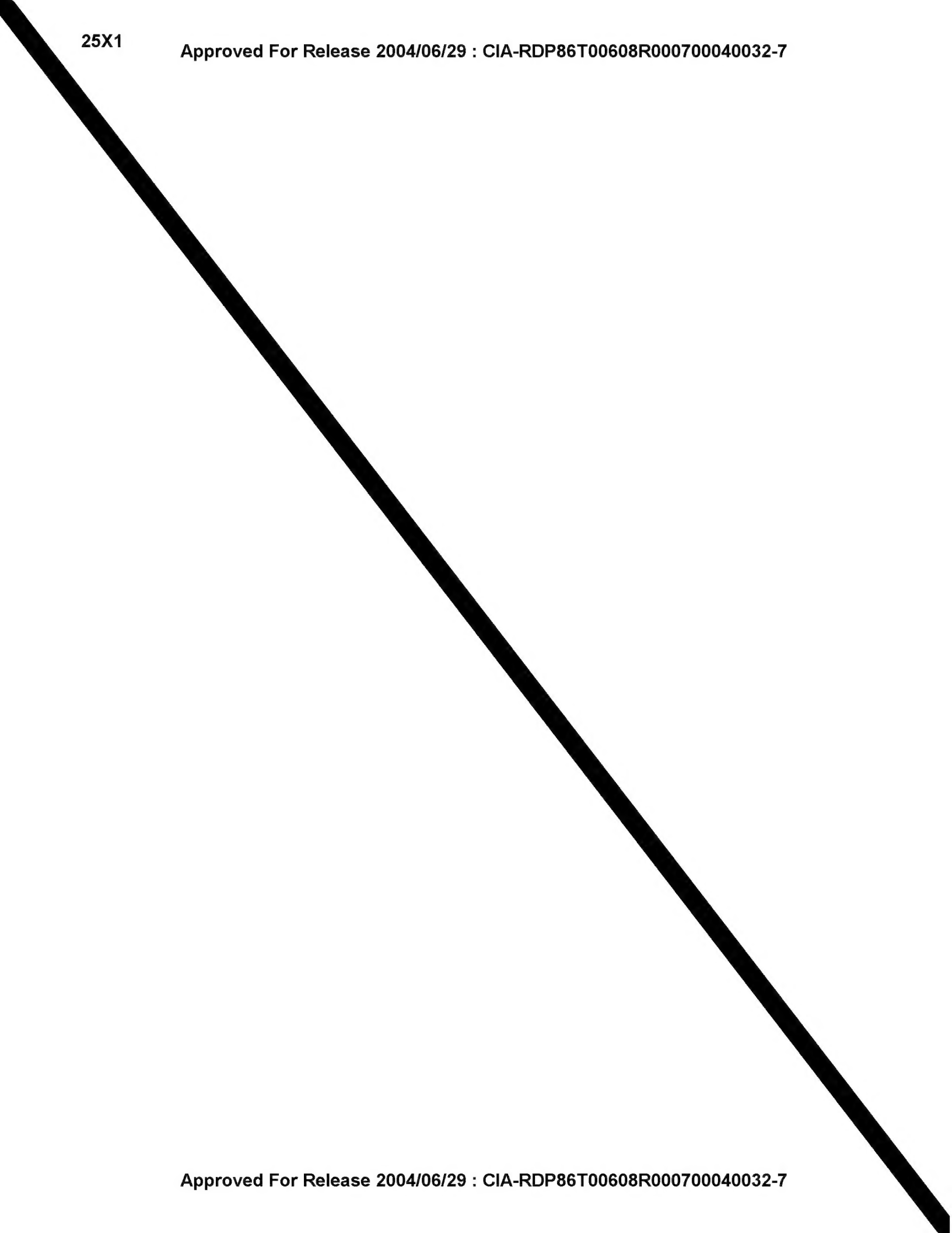

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WEEKLY SURVEYOR

USSR AND EASTERN EUROPE

Eastern European countries prefer Western computers and related equipment. The preference of many East European institutes for Western minicomputers may indicate that CEMA minicomputers lack the reliability, supporting software, and peripheral equipment characteristics of Western machines.

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The USSR is inviting the participation of selected US technicians in Soviet seminars on processed vegetable protein in an effort to acquire the latest US technology on this subject.

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Television coverage of the Soyuz 18/Salyut 4 mission shows the cosmonauts wearing space suits of a new configuration. Preliminary assessment of this suit indicates the Soviet may have closed the gap somewhat in an area of technology where they had been badly out distanced.

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Ye. P. Velikhov has revealed more details concerning the Soviet plans for the T-20 Tokamak. Due to the enormous size of the T-20, it probably will be built in the Moscow or Leningrad areas and probably will not be operational until after 1980.

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Soviet color TV parts and materials for tubes are in large measure unacceptable.

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Difficulties in making the color tubes continue to be reflected in official Soviet production figures for complete sets. Output in 1974 was only 429,000, nearly 300,000 below plan.

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The engine assembly line being supplied by Ingersoll-Rand to the Kama River Truck Plant includes a US mechanized system for adjusting valve clearance that is not in use elsewhere. The system will reduce time required for valve adjustments from minutes to seconds and will improve the accuracy of settings.

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LATIN AMERICA

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The Libyan-Argentinian nuclear agreement is geared primarily towards locating domestic Libyan uranium resources. With a domestic supply of uranium, Libyan would then have a source of unsafeguarded uranium.

WESTERN EUROPE

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A French delegation is to visit Abu Dhabi, the largest and richest member of the United Arab Emirates, to study the possibility for cooperation in the peaceful uses of nuclear energy. French assistance at this time is expected to be limited to an initial feasibility studies on a dual-purpose, power and water desalination nuclear reactor.

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France will have the first European fiber optical communications (FOC) operational test link. With this link scheduled for completion by the end of 1975, the French slightly lag the Japanese and slightly lead the US in FOC systems testing.

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MISCELLANEOUS

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A Canadian project to improve the yield and quality of low toxicity rapeseed could result in rapeseed becoming the biggest competitor to soybeans for vegetable oils and animal feed.

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NUCLEAR ENERGY

Soviets Release More Details Concerning Plans for T-20 Tokamak: Ye. P. Velikhov, Deputy Director of the Kurchatov IAE, revealed more details concerning Soviet plans for the T-20 Tokamak during his visit to the US in June. The physical size of the T-20 will be roughly four times that of the T-10, and it will cost 30 times as much. Its plasma (ohmic heating) current will be six times larger than that of the T-10 and will be produced using a 200-megajoule (MJ) inductive store. Unlike the T-10, the T-20 will burn deuterium-tritium (D-T) and will incorporate neutral beam and RF heating. The T-20 will draw 1200 megawatts (MW) from the local power grid during operation and is being planned to take advantage of the experience gained from the T-10 and Princeton Large Torus (PLT) Tokamaks.

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Comment: If the Soviets successfully build and operate the T-20, they will have obtained a major milestone in the world CTR effort. The T-20, as envisioned, could demonstrate the scientific feasibility of a Tokamak fusion reactor and probably would demonstrate the practical feasibility of a Tokamak fission/fusion hybrid reactor.

The T-20 would be the first Soviet Tokamak to burn D-T. The 200-MJ inductive store is 7-10 times larger than any known Soviet inductive store. At present, only the Moscow and Leningrad power grids could supply the 1200 MW needed for the T-20. Due to the enormity of the leap from the T-10 (which has just become operational) to the T-20, it seems improbable that the Soviets could have the T-20 operational by 1980.

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The US plans to have a D-T burning Tokamak in operation by 1980; however, this will be only half the size of the T-20.

United Arab Emirates Will Receive French Nuclear Study Group: On 4 July, France and the United Arab Emirates signed an agreement on cultural and technical cooperation, and the French Minister of Industry announced that

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[redacted] 25X1

he would send a delegation to Abu Dhabi to study the possibility for cooperation in the peaceful use of nuclear energy, particularly for nuclear power and the desalination of sea water. [redacted] 25X1

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Comment: Abu Dhabi, the leader and richest member of the United Arab Emirates, recently has shown an interest in acquiring foreign nuclear assistance. French assistance at this time is expected to be limited to initial feasibility studies on the possibility of building a dual-purpose, power and water desalination nuclear reactor.

In addition to Abu Dhabi, Saudi Arabia, Kuwait and Bahrain are also investigating assistance in similar projects. In all cases, these countries will be completely dependent upon foreign assistance to carry out such projects. Responsible officials in these countries realize that the construction of dual-purpose nuclear reactors would be a long term project. Saudi Arabia has suggested that Kuwait and Bahrain join with them in a joint regional project to construct a large nuclear power and desalination reactor, but there is no indication that Saudi Arabia has studied the problems of distributing power and water from such a regional project to the three countries. [redacted] 25X1

Libyan-Argentinian Nuclear Agreement Signed: The Libyans have signed a protocol with Argentina on cooperation in scientific research and nuclear energy. Argentina will supply equipment for detecting radioactive ores and specialists in exploration in Libya, and Libyan chemists will be trained in Argentina in the extraction and processing of uranium. [redacted] 25X1

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Comment: Argentina has extensive experience in both exploration and concentration of uranium and can be of considerable assistance to Libya, at least in the exploration stage. However, as yet Libya has not discovered any uranium deposits although a modest exploration effort has been under way for about a year. The agreement with Argentina is a continuation of Libya's efforts to obtain self-sufficiency in its nuclear fuel cycle, which starts with a domestic and therefore unsafeguarded uranium supply. [redacted] 25X1

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[redacted] 25X1

PHYSICAL SCIENCES AND TECHNOLOGIES

France Will Have the First European Fiber Optical Communication Operational Test Link: In the past 2 years the French have developed a prototype 8 Mbit/s fiber optical communications (FOC) system mostly composed of foreign FOC components. They plan to conduct operational tests of such a system at Lannion, France. [redacted] 25X1

Comment: The French operational FOC system test link, which should be finished by the end of 1975, will be the first European field demonstration of a FOC civil communications system even though both the UK and West Germany lead France in FOC component research and development. Japan is the only country in the world that has already operationally tested a FOC system, although three independent US companies plan to install trial FOC links by early 1976.

In field tests, tradeoffs of future capacity upgrading, loss and dispersion limitations, and short and long term costs will have to be considered. The moderately high capacity 8 Mbit/s system could handle 120 digitized voice channels or one videophone channel but not a standard television channel. The French indicated that eventually semiconductors lasers will be used for transmitters; initially light emitting diodes, LEDs, will be used. But they are concerned that the advantage of lasers would not be realized due to dispersion limits of the multimode step-index fiber they currently favor. Based on dispersion alone, a graded-index fiber of the same length and attenuation could handle about 10 times as many voice channels with LEDs and about 200 times as many channels with semiconductor lasers. [redacted] 25X1

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Eastern-European Countries Continue to Purchase US Computers and Related Equipment: Several East European countries have purchased US PDP series minicomputers in recent months. Bulgarian, Czechoslovak, East German, Polish, and Romanian facilities have ordered combinations of PDP-8, PDP-11, and PDP-15 systems and peripherals for various applications. The equipment on order has a US value of $955,000 with $717,000 representing purchases in

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25X1 recent months and $238,000 representing purchases made in late 1974 or early 1975.

Comment: Eastern European institutes continue to prefer purchasing Western computers and related equipment, if given a choice. Several CEMA countries produce minicomputers including the USSR, Bulgaria, Czechoslovakia, and Hungary. Some of these models are copies of the US Digital Equipment Co., PDP series. The preference of many East European institutes for Western minicomputers may indicate that CEMA minicomputers lack the reliability, supporting software, and peripheral equipment characteristic of Western machines. Contrary to their stated intentions to meet their computer needs from domestic sources and other CEMA countries in 1975, the East Europeans probably will continue to purchase Western computers and related equipment. 25X1

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[redacted] 25X1

Soviet Color TV Problems Continue: Soviet parts and materials used in color television (CTV) tube manufacturing are in large measure unacceptable [redacted] 25X1

[redacted] Only the gun mounts were found to be acceptable, though subject to high voltage breakdowns and dimensional tolerance deficiencies. Anode buttons were poorly designed and fabricated, causing production losses due to implosion. Sheet metal used to make anode buttons and shadow mask studs had the wrong alloy content, leading to expansion problems and subsequent breakage of the mask and funnel. Pumice, used as a polishing material for the face of the tube, caused excessive scratching. Finally, 11 of 17 materials used in making the glass for the tube were found to be unacceptable or marginal. For example, simple substances such as sand and potash were chemically unsuitable. [redacted] 25X1

Comment: Soviet difficulties with the manufacture of color TV tubes continue to be reflected in official production figures for complete sets. Although Soviet CTV receiver output reached an all-time high of 429,000 in 1974, planned production called for 700,000 sets. Moreover, the 1975 plan has been revised downward from 1.5 million to 600,000. The sorry state of affairs is seen further in that the USSR State Standards Committee is only now developing uniform technical standards for color set performance, 7 years after the first sets began rolling off the assembly lines. [redacted] 25X1

25X1 [redacted]

New Innovation on Engine Assembly Line for Soviet Kama Truck Plant: The highly automated, $19 million engine assembly line being supplied by Ingersoll-RAND to the Kama Truck Plant will include a new US mechanized system for adjusting valve clearance. The USSR is the first and only country using this US system.

The process involves the use of electric pulses to measure valve depression from the valve seat. With the pushrod on the high point on the cam, a spindle rotates the rocker screw to unseat the valve. A solid-state control, which counts pulses measured in degrees of screw 25X1

[redacted]

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rotation, automatically stops the spindle after a predetermined number of pulses have been counted. A second spindle then tightens the rocker nut, locking the screw at that point and leaving the valve full open at the clearance specified. [redacted] 25X1

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Comment: This job, which normally is performed manually even on the highly mechanized US assembly lines, reduces time required for valve adjustments from minutes to seconds. At the same time, it improves accuracy of settings and ensures that all valves are adjusted alike. The process is certain to be installed on US assembly lines in the future. 25X1

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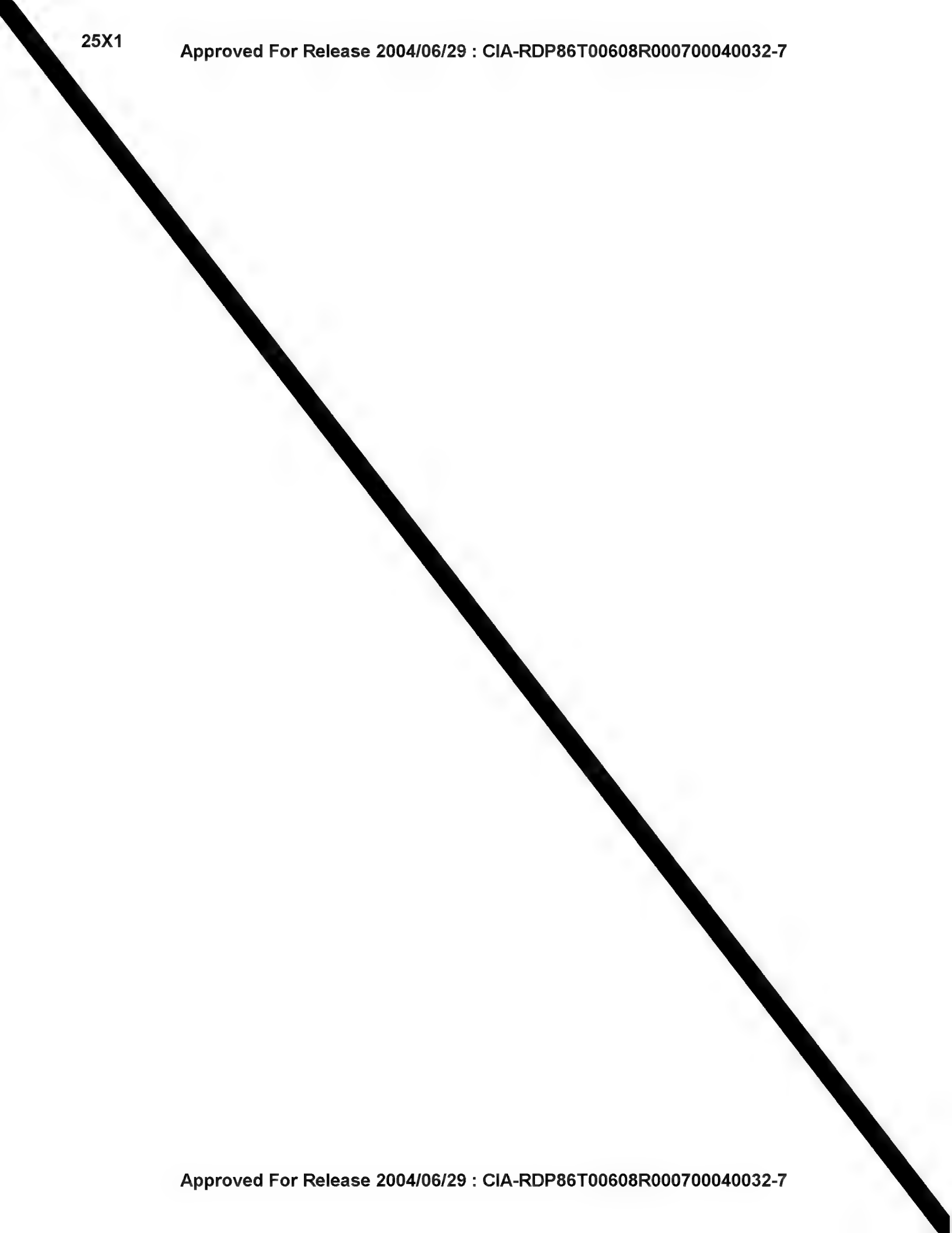

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AGROTECHNOLOGY AND FOOD RESOURCES

Soviets Seek US Technology for Isolating Edible Plant Protein: Scientists at the Institute of Organo-Elemental Compounds, Moscow, have been trying without success to isolate protein for human consumption from the seed of sunflowers and cotton. In early 1975, they invited a US company to participate in a seminar on the utilization of vegetable protein for human consumption. Interest in purchasing US soy protein for long-term needs was implied. The actual discussions, however, held in May 1975, were an attempt to obtain the latest US technology on this subject without cost.

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Comment: This is not the first time the Soviets have used the seminar gambit in an attempt to gain US technology for the utilization of protein from unconventional sources. In 1973, representatives of a large US agribusiness firm were invited to present a private seminar in Moscow on texturized vegetable (soy) protein.

The Soviets have a broad interest in all processed vegetable protein. In order to acquire in-depth knowledge on the subject, the USSR State Committee for Science and Technology is trying to organize symposia with invitees from the US, Japan, and West European countries. Those invited are usually technically oriented rather than basic scientists.

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Canada to Begin New Research Project on Rapeseed: Begining in 1975, the Rapeseed Association of Canada will spend nearly $0.5 million for a 3-year project to improve the yield and quality of low toxicity rapeseed. The association hopes to have disease resistant varieties adapted to specific areas ready for commercial growers in the three prairie provinces by the end of the 3-year period.

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Comment: The Canadians sacrificed rapeseed yield and oil content during an earlier urgent but successful search for varieties with low erucic acid and glucosinolates, the principal toxic factors in rapeseed. This new project aims to bring yields back to previous levels, or higher, if possible. With these improvements, rapeseed

[redacted] 25X1

could become the biggest competitor to soybeans for vegetable oils and animal feed.

Rapeseed produces a high value protein feed similar to soya, and its oil content is double that of soya. Furthermore, rapeseed requires only simple crushing to derive the oil, while soya requires more expensive extracting techniques. [redacted] 25X1

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Soyuz 18/Salyut 4 Cosmoanuts Have New Pressure Suits: Moscow television has provided extensive coverage of the Soyuz 18/Salyut 4 manned space mission. In one sequence cosmonauts were shown in pressure suits during boarding of the launch vehicle.

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Comment: From television coverage, it was apparent that the cosmonauts were wearing space suits of a new configuration. The most striking changes in the new suit are a more compact redesigned shoulder joint and a much less bulky helmet design. The new suit helmet is not detachable and appears to be integrated with the suit by an extension of suit material up the back of the neck and over the head to cover the integral protective hard hat completely. This suit which is designed to provide the cosmonaut with protection on launch and reentry in the event of cabin pressurization loss appears to be much less bulky in appearance than previous suit configurations. It generally resembles US prototype get-me-down suits. Preliminary assessment of this new suit makes it appear that the Soviets have closed the gap somewhat in this area of technology where they have been badly outdistanced.

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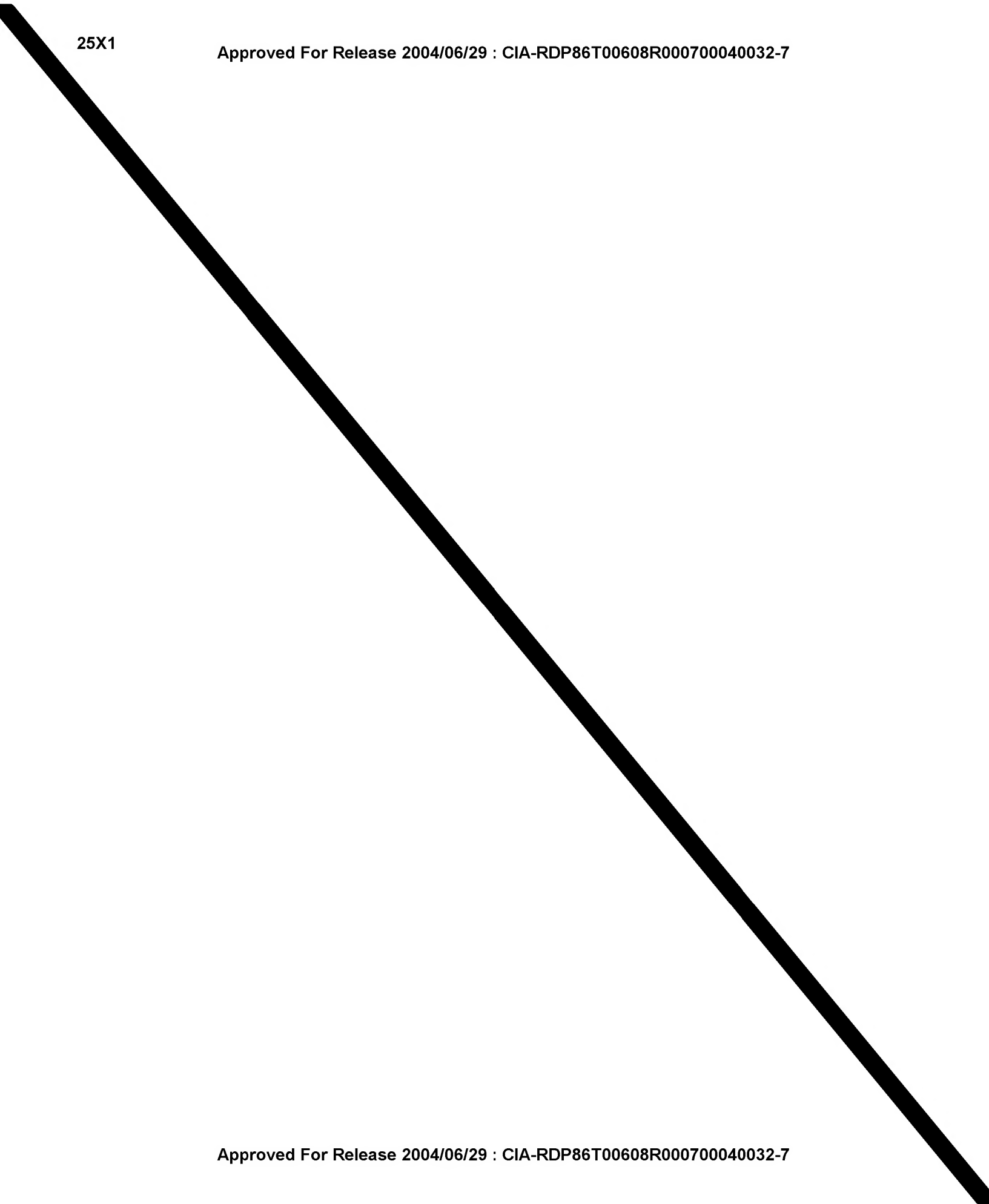

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